Michigan Department of Community Health Bureau of Laboratories 2011 Annual Report

Michigan Department of Community Health
MDCH
Rick Snyder, Governor
Olga Dazzo, Director

MDCH
Bureau of Laboratories

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STATE OF MICHIGAN
DEPARTMENT OF COMMUNITY HEALTH
LANSING

RICK SNYDER
GOVERNOR

OLGA DAZZO
DIRECTOR

2011 was a year for reassessment and rebuilding for the Bureau of Laboratories (BOL). The economic downturn has brought upon many changes. State funding cuts caused closure of the Houghton branch laboratory and cut support for parasitology and mycology services. Retirement incentives resulted in the combined loss of centuries of collective technical and leadership experience. The BOL also experienced federal funding cuts to state preparedness, preventative block grant and infectious disease programs. Through these challenging times and funding fluctuations the BOL staff and management are determined to continue in our commitment to excellence in leadership in providing quality laboratory science for healthier people and communities in Michigan.

- Improved Efficiency

Dr. Jeff Massey, Quality Assurance Officer, continued building our knowledge in quality systems and improvement. Everyone in the Bureau received an orientation to Lean. The Data and Specimen Handling Unit (DASH) completed value stream mapping and re-invented their workflow resulting in faster and more efficient data entry. Virology and Trace Metals Sections eliminated waste and re-evaluated space allocation to improve work flow. We continue to seek and eliminate energy inefficiencies and waste streams.

- Consolidating Services

Under the leadership of Dr. James Rudrik, Microbiology Section Manager, the Bureau examined the potential for savings in de-centralized chlamydia and gonorrhea testing. By honing the test sites from 5 to 2, $100,000 in quality control testing and other costs were re-directed to testing services.

- Re-Evaluate Needs

The Regional Laboratory System underwent a major organizational overhaul to accommodate changes in testing technology and the reality of shrinking resources. The current model provides local public health agencies access to quality assurance resources and consultation based on individual agency regulatory and programmatic needs.

- Investment

Investments in technology and human capital have not halted. The Bureau continues to pursue testing platforms that are at least as accurate and efficient as conventional methods. We are replacing conventional biochemical and chromatographic identification of bacteria with sequencing. We are acquired laboratory technology for emerging health needs like pyrosequencing to identify antiviral resistance in influenza and Severe Combined Immunodeficiency Disease (SCID) in newborns.

We are committed to investing in developing and retaining a trained and competent workforce. We are utilizing distance learning options to maintain and build technical, safety and quality knowledge among the Bureau staff. For the first time all staff have a performance evaluation objective to participate in at least one non-mandatory training. We continue to find ways to improve the work environment to show employees that they are valued. The Healthy Living VP Group has scheduled exercise and nutrition classes, organized a vegetable garden that donates the harvest to local food banks, and they are tracking results of these efforts.

The Bureau of Laboratories will continue to adapt to changes and funding challenges, including whatever impact the Affordable Care Act has on public health laboratories and other programs. We will continue our mission to efficiently meet the needs of our communities.

Frances Pouch Downes

Frances Pouch Downes, Dr.P.H.
Laboratory Director

Table of Contents

Our Mission: We are dedicated to continuing leadership in providing quality laboratory science for healthier people and communities through partnerships, communication, and technical innovation.

Our Vision: The Bureau of Laboratories is a stronger, more diverse team within an integrated public health system. We utilize advanced technology and innovative leadership to provide comprehensive public health services in our dynamic global community.

2011 Accomplishments

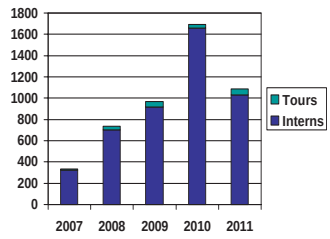
- The Bureau of Laboratories hosted the Bangladesh's Secretary of the Ministry of Health and Family Welfare and his accompanying delegation for a first-hand experience on the U.S. public health laboratory system.
- The Bureau of Laboratories Safety Officer provided on-site accreditation reviews for 13 local health departments.
- The Bureau of Laboratories hosted 2 Michigan State University (MSU) students for a 5 week Clinical Diagnostic Molecular rotation and 1 MSU student for a 1 week molecular rotation.
- The Laboratory Systems Section LIMS, with the help of the APHL PHLIP Team, went live with HL7 messaging to CDC for all respiratory virus results.
- The Laboratory Systems Section LIMS group successfully completed the migration of all Division of Infectious Diseases tests from our legacy system to StarLIMS.
- The Virology Section Manager, Dr. Anthony Muyombwe obtained the High Complexity Laboratory Director certification by the American Board of Bioanalysis.
- To improve test turn around time, the Virology Section converted nine manual EIA assays to the automated EVOLIS platform.
- During the 2011 rabies season, the Virology Section tested 2200 animals that exposed individuals in Michigan. Because of the 7 day testing schedule, 2135 of these animals tested negative in time to stop unnecessary post-exposure prophylaxis resulting in a health care cost savings of $22-33 million.
- The Microbiology Section Manager, Dr. James Rudrik, received a BioWatch Award of Excellence for Laboratory Operations at the BioWatch National Workshop in September, 2011.
- The Mycobateriology Unit of the Microbiology Section participated in a retrospective multi-center study with CDC to evaluate the time-to-negative for *Mycobacterium tuberculosis* complex in broth-based culture systems. The outcome of this study will lead to new laboratory guidelines.
- A series of photomicrographs provided by the Microbiology Section Mycology Laboratory were published in a Mycology manual entitled "Micologia Advancada, Volume IIA Taxonomia De Fungos Anamorficos - I. Hifomicetos" Wilmar Corio Da Luz, editor, 2011. Revisao Anual de Patologiade Plantas, Passo Fundo, Brasil.
- The Newborn Screening Program added the following conditions to the Newborn Screening panel with associated biological marker: Alpha thalassemia (Hemoglobin H disease - Barts Hemoglobin) and Severe Combined Immune Deficiency and related disorders (T cell receptor excision circles, TRECs).
- The Newborn Screening Program converted to a new FDA approved method for Biotinidase that provides improved precision over the legacy method.
- The Newborn Screening Program evaluated and moved to production two new tandem Mass Spectrometers (Waters Acquity TQD) using a non-derivatizing reagent system. Tyrosinemia type 1 (succinylacetone) is now included in the MDCH Newborn Screening panel using this FDA approved system.
- The Analytical Chemistry, Trace Metals Section validated polyaromatic hydrocarbon (PAH), nickel and vanadium testing methods for fish tissue in response to the Enbridge Oil spill in the Kalamazoo River.
- Analytical Chemistry provided critical laboratory results on fish samples from the 10 Mile Canal/Lake St. Clair area.
- The Trace Metals laboratory validated inductively coupled plasma optical emission spectroscopy (ICP-OES) technology for environmental lead testing.
- The Analytical Chemistry, Trace Metals Section added toxaphene method by GC-MS to the existing panel (PCBs, pesticides, mercury) for the fish advisory program.
- The Analytical Chemistry Section was awarded the second year of an APHL Environmental Health two-year Fellowship award.

Grants Received in 2011

- The Microbiology Section completed the third year of a five-year TB genotyping contract with CDC. In FY 2011, over 4800 TB isolates from 27 cities and states were tested at the MDCH laboratory. This contract, worth approximately $2.7 million, will seek to type 25,000 TB isolates between 2009 and 2013.
- The Microbiology Section was awarded a $200,000 cooperative agreement for 2011 from the Food Emergency Response Network (FERN). Funding is used to develop surge capacity for food borne outbreaks and to develop new rapid methods to detect food borne organisms.
- The Microbiology Section completed the first year of participation in the Enteric Research Investigational Network study with Michigan State University. The project funded by NIH will investigate the impact that four common diarrheal pathogens, *Salmonella*, *Shigella*, *Campylobacter*, and shiga toxin-producing *E. coli,* have on the composition and function of the intestinal microbiome. Over the five-year project MDCH will receive over $250,000 in funding.
- The Laboratory Systems Section received a $20,000 grant from the Association of Public Health Laboratories (APHL) for laboratory system improvement. This funding was used to produce a virtual tour video of the MDCH State Public Health Laboratory and hold a “Leave a Legacy” meeting designed to encourage participants to give back to their professions through mentoring, living your passion, and leaving a legacy for future professionals.
- The Laboratory Systems Section completed year 1 of the CDC Infrastructure and Interoperability Grant to implement HL7 messaging of viral respiratory results to CDC; upgrade our HL7 message from 2.3.z to 2.5.1; and enroll two additional hospital laboratories into electronic messaging of Michigan Reportable Diseases to the Michigan Disease Surveillance System. This grant provides $588,000 over two years.
- The Laboratory Systems Section received a $15,880 grant from APHL for a Legislative Policy and Communication Skills Workshop. This workshop enhanced understanding of how the Michigan congressional delegation, Michigan legislature and Executive Office function when dealing with issues of scientific and public health importance. The workshop was held during the legislative spring session, allowing participants the opportunity to tour the State Capitol and see the State House of Representatives in Session.
- The Chemistry and Toxicology Division received a $950,000 Public Health Emergency Preparedness grant to support the Chemistry Laboratory Response Network.
- The Newborn Screening program received a $775,924 two-year grant from CDC to support the startup of SCID screening and optimize test methodology, expand staff expertise, provide training for public health about SCID screening and share appropriate laboratory and program methods and protocols.

Lab Tours/Trainings

Laboratory staff hours per year:
working with interns, guiding lab tours



2011 Interns include MSU clinical interns; and academic interns from MSU, U of Detroit-Mercy, and U of M-Flint.

1088 total hours were spent in 2011 on tours (55 hours) and intern trainings (1033 hours). 24 tours were given with an average size of 6 people each.

BOL Screening for SCID and Other Primary Immunodeficiency Syndromes

On October 1, 2011, the MDCH Newborn Screening Section began screening all newborns born in Michigan for severe combined immunodeficiency syndrome (SCID) and other primary immunodeficiency syndromes (PIDs). The new assay identifies newborns at risk for PID syndromes, most notably SCID, the most severe type of primary immunodeficiency. SCID is a rare and lethal syndrome in which there are profound deficiencies of T and B lymphocyte function and also of natural killer cells and their function. The prevalence of SCID has been estimated to be between 1 in 40,000 and 1 in 100,000. The true prevalance will not be known until more data is obtained by newborn screening programs.

Infants with SCID have a 95% chance of survival if the disorder is detected and treated with a bone marrow transplant within the first three months of life, before the development of severe life threatening infections. Survival decreases as the baby ages and is subjected to possible life threatening opportunistic infections. These statistics underscore the importance of early detection by the addition of SCID to the newborn screening panel.

BOL Staffing Changes

- New DASH Supervisor. Matthew Bashore was promoted to supervisor of the Data and Specimen Handling Unit (DASH) on June 1, 2011. Previously Matt had been employed as a technician in the Microbiology Section.
- New Mycobacteriology and Mycology Unit Manager. On February 20, 2011, Angie Schooley was promoted to the manager of the Mycobacteriology and Mycology Unit within the Microbiology Section. Ms. Schooley has been a senior microbiologist in this section for over 14 years.
- Swarup Khiroya retired from the Newborn Screening Section on January 15, 2011. Rupa was trained in all areas of the Newborn Screening laboratory where she worked for over 10 years.
- New employees hired in 2011:

  Stephanie Curry, BS - Chemistry and Toxicology Division
  David Slabberkoorn, BS - Chemistry and Toxicology Division
  Michelle Evans, BS - Chemistry and Toxicology Division
  Shaun Moloney, BS (MT ASCP) - Chemistry and Toxicology Division
  Piotr Pawlak, PhD - Chemistry and Toxicology Division
  Michael Stagliano, PhD - Chemistry and Toxicology Division
  Colin Johnson, BSc, APHL Fellow - Chemistry and Toxicology Division
  Emily Moreno, BSc, MPH - Chemistry and Toxicology Division
  Joseph Columbo, BS - Chemistry and Toxicology Division
  Kourtney Marx, BS - Division of Infectious Diseases

BOL Virtual Tour Video

Grant funding received in 2011 allowed the Bureau of Laboratories to create a virtual tour of the laboratory that includes all aspects of testing performed plus testimonials from laboratory management and staff, as well as from Michigan Laboratory System partners. *MDCH Bureau of Laboratories* is a ten-minute introduction to the state public health laboratory in Michigan. Not your typical lab tour, this video features nineteen laboratory employees and two clinical partners talking about our work and why it makes a difference. The background footage features several additional laboratory staff who do not speak on camera. The video is appropriate for all audiences and is intended to inform viewers who have little or no understanding of the exciting and unique work that is done "behind the scenes" in public health.

This video was conceived as a tool for presentation to a live audience in an interactive setting such as a classroom, conference meeting, etc., to help achieve a goal set by the Michigan Laboratory System Advisory Group to "raise visibility of the entire Laboratory System."

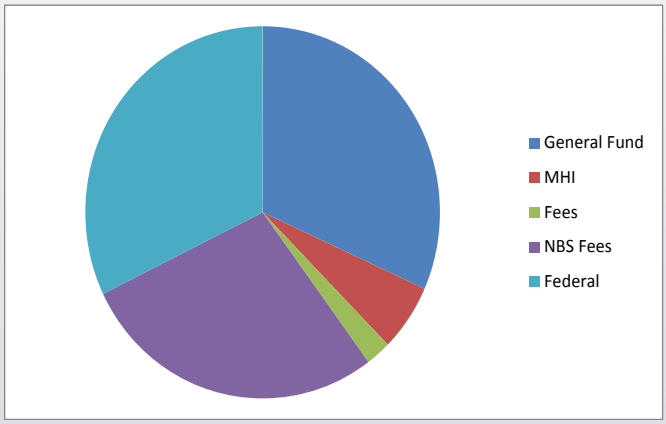
View our video by pasting this link into your browser: http://www.youtube.com/watch?v=9bG--orSVEA

Michigan Regional Laboratory System Changes

For almost two decades, the Michigan Regional Laboratory System (MRLS) has provided a structure of quality assurance for local public health agencies performing testing on human specimens in a non-traditional laboratory or point-of-care setting. The MRLS has enabled local public health agencies to meet the federal regulatory requirements of CLIA'88. However, in the years between the inception of the MRLS and now, there have been profound changes in diagnostic technology and state and local public health resources, resulting in fundamental organizational and oversight changes. These changes include:

- each local public health agency has obtained and manages its own CLIA certificate
- MDCH laboratory provided training to prepare on-site coordinators for their new roles
- current Technical Consultants continue to provide assistance with basic membership in the MRLS for a minimal fee
- enhanced services are available from Technical Consultants for additional charges.

FY2011
Laboratory Funding Sources



Mozambique Twinning Initiative Ends

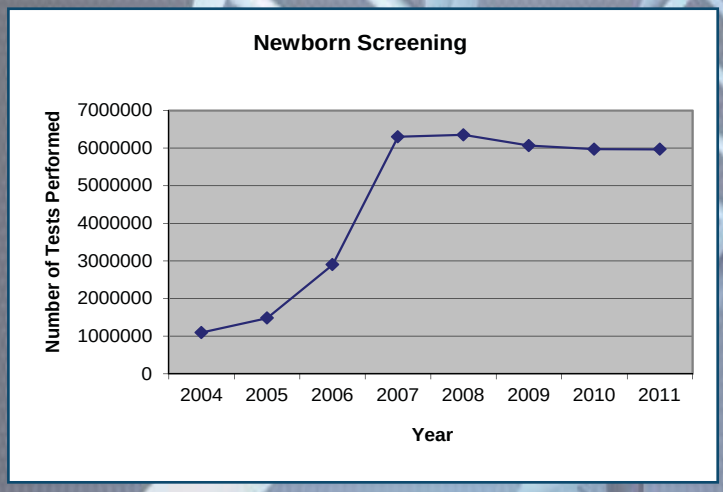
Margaret Casey, a laboratory scientist in the Virology laboratory, visited Muputo, Mozambique in July, 2011 to complete the three-year WHO/APHL twinning Initiative. Goals of the Twinning Project were:

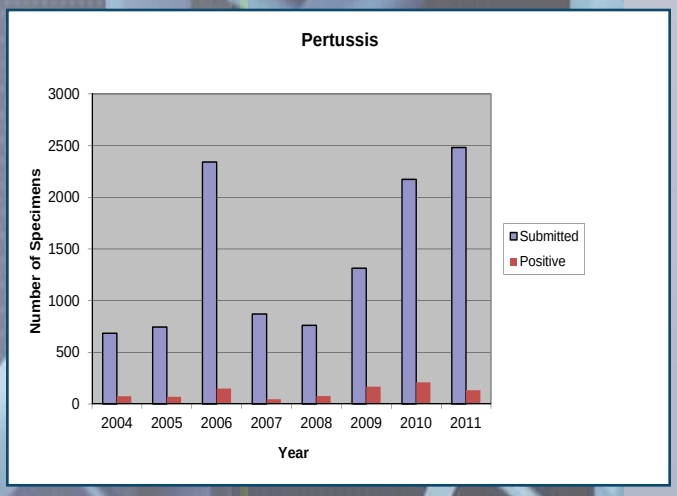
- Implementation of a quality management system
- Training of Mozambican scientists in modern laboratory methodologies

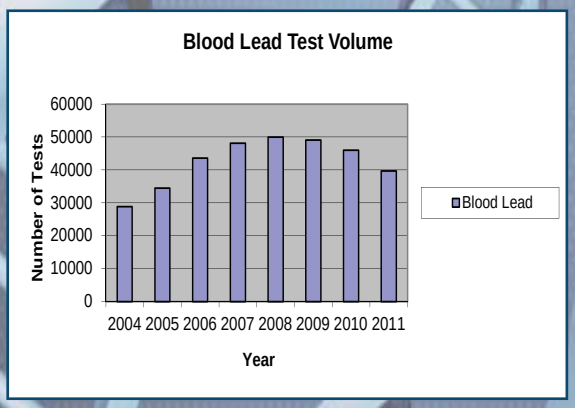
This three-year project began when the BOL partnered with the Mozambique National Institute of Health and the Los Angeles County Public Health Laboratory in the WHO Laboratory Twinning Initiative. The project was coordinated through the Association of Public Health Laboratories and promoted technical cooperation, best management practices and long lasting international exchange.

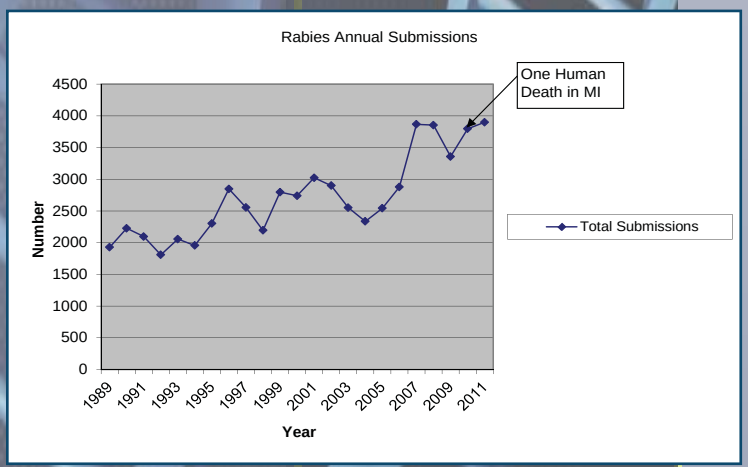
Ms. Casey's final visit completed the training of staff by reviewing techniques previously learned at the BOL and assisting in any troubleshooting activities needed to implement viral culture assays in the Mozambique laboratory. Mozambique staff have now successfully completed training and passed their competency evaluations for respiratory virus culture.

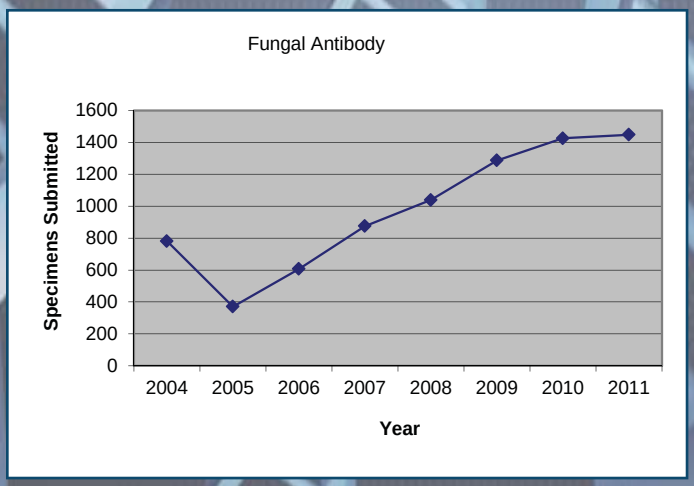
By The Numbers











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